

means for reactively coupling the communication signals to the powerline without tapping the powerline; and
means for receiving said communication signals at a second location.

39. The non-invasive powerline communications system of claim 38 in which said means for generating includes a first communications device.

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40. The non-invasive powerline communications system of claim 38 in which said means for reactively coupling includes means for inductively coupling said communication signals to the powerline.

41. The non-invasive powerline communications system of claim 40 in which said means for inductively coupling includes a communications core element disposed about the powerline and a plurality of windings disposed about said communications core element for coupling said communication signals to the powerline.

42. The communications system of claim 38 in which said means for reactively coupling includes an inductor.

43. The non-invasive powerline communications system of claim 38 in which said means for receiving includes means

for reactively coupling said communication signals on the powerline at said second location.

44. The non-invasive powerline communications system of claim 43 in which said means for reactively coupling includes means for inductively coupling said signals to and from the powerline.

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45. The non-invasive powerline communications system of claim 44 in which said means for inductively coupling includes a communications core element disposed about the powerline and a plurality of windings disposed about said communications core element for coupling said communication signals to and from the powerline.

46. The non-invasive powerline communications system of claim 38 further including means for extracting from the powerline said communication signals transmitted from said second location.

47. The non-invasive powerline communications system of claim 46 in which said means for extracting includes means for reactively coupling from the powerline said communication signals transmitted from said second location.

48. The non-invasive powerline communications system

of claim 47 in which said means for reactively coupling from the powerline said communication signals transmitted from said second location includes means for inductively coupling from the powerline said signals transmitted from said second location.

49. The non-invasive powerline communications system of claim 48 in which said means for inductively coupling includes a communications core element disposed about the powerline and a plurality of windings disposed about said communications core element.

50. The non-invasive powerline communications system of claim 1 further including means for encoding said communication signals.

51. The non-invasive powerline communications system of claim 41 in which said means for inductively coupling further includes driver means for providing low voltage, high current pulses of said communication signals to said plurality of windings to inductively couple said pulses to the powerline.

52. The non-invasive powerline communications system of claim 38 further including a storage device proximate said first location.

53. The non-invasive powerline communications system of claim 52 further including means for transmitting said communications signals to said storage device.

54. A non-invasive powerline communications transmitter, comprising:

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means for generating communication signals for transmission on a powerline; and

means for reactively coupling said communication signals to the powerline without tapping the powerline.

55. A non-invasive powerline communications receiver for receiving communication signals transmitted over a powerline, comprising:

means for receiving the communication signals transmitted over the powerline; and

means for reactively coupling the communication signals from the powerline to said means for receiving without tapping the powerline.

56. A non-invasive powerline communications system comprising:

a sensor for sensing a condition of a powerline;

a base station remote from the sensor;

means for reactively coupling a signal from the sensor onto the powerline for transmission to the remote

58. The modular core, self-powered powerline sensor of claim 57 in which said modular core elements are formed of highly permeable ferromagnetic material.

59. The modular core, self-powered powerline sensor of claim 58 wherein the windings of each said modular core element are interconnected electrically in series or in parallel.

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60. The modular core, self-powered powerline sensor of claim 58 in which said plurality of windings are energized by non-contacting transformer action with the a.c. powerline.

61. The modular core, self-powered powerline sensor of claim 58 in which said means for sensing a condition includes means for sensing the voltage on the a.c. powerline.

62. The modular core, self-powered powerline sensor of claim 58 in which said means for sensing includes means for sensing the current of the a.c. powerline.

63. The sensor of claim 57 in which said means for sensing includes an inductor.

base station without tapping the powerline;

means for reactively coupling said signal transmitted on the powerline from the powerline to the remote base station without tapping the powerline;

means for reactively coupling a signal generated by the base station onto the powerline without tapping the powerline; and

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means for reactively coupling the signal on the powerline from the base station to the sensor without tapping the powerline.

57. A modular core, self-powered powerline system, comprising:

a plurality of modular core elements for disposing about an a.c. powerline;

a winding layer to be energized by the a.c. powerline, including a plurality of windings disposed about each said modular core element, wherein the windings of each said modular core element are interconnected;

means for sensing a condition in or about the a.c. powerline;

controller means, powered by said windings and responsive to said means for sensing, for receiving a signal indicative of the condition sensed; and

means for reactively coupling the said signal to the powerline without tapping the powerline.

Communications